

*J kilogrammes steam corresponds therefore to $9 \times 650 =$

5,850 calories, which must be taken as a deduction from the above $H U > U_0$ calories, so that the decomposition only requires

In this the steam, in its introduction into the producer, performs mechanical work, thus, should it in some way drive the air supply into the producer, its energy content would be smaller and the requisite amount of heat for its decomposition be higher, which however will be aimed at here.

Thus the amount of heat, 28,750 calories which is expended in the decomposition of J) kilogrammes steam, from which 1 kilogramme of H is produced which under normal conditions occupies a volume of $1 \times 12 \times 15$ cubic metres; the production of 1 cubic metre of H by decomposition of steam requires therefore

an amount of heat of $\frac{28,750}{12 \times 15} = 158.3$ (21).

Thus the production of 1 cubic metre of H , which is brought about by the decomposition of steam, involves in water-gas or steam-air gas an absorption of 2,585 calories from the reaction chamber and a corresponding diminution in the temperature of reaction.

Thus by the addition of steam to the air supply a means is found of bringing the temperature of reaction to a specified standard and to maintain it thereat.

As hereinbefore the most favourable reaction temperature has been taken at 1,150°, and since at this temperature all atmospheric oxygen is converted into CO , and (practically speaking) all water-vapour is decomposed, and as well all of any CO_2 by H is formed under the circumstances will be converted into CO , it should be investigated how much steam is required for using the atmospheric air in maintaining a reaction temperature of 1,150° and what composition of gas would result therefrom.

(II) STEAM-AIR GAS WITH PITCH CO FORMATION.

Firstly, the case should be considered in which pure CO is produced, so that the product of the producer may consist of

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